COLORADO RIVER RECOVERY PROGRAM Project No.: 131
FY-2004 SCOPE OF WORK

Lead Agency: Fish and Wildlife Service
Colorado River Fishery Project

Submitted by: Chuck McAda, Project Leader (lead)
Bob Burdick, Fishery Biologist
764 Horizon Drive, Building B
Grand Junction, CO 81506
(970) 245-9319, Fax 245-6933
chuck_mcada@fws.gov
bob_burdick@fws.gov

Date: May 16, 2003 ; revised June 11, 2003

Category	Expected Funding Source
xx Ongoing project	xx Annual funds
_ Ongoing-revised project	__ Capital Funds
_ Requested new project	__ Other
_ Unsolicited proposal	

I. Title of Proposal: **Population Estimate of Humpback Chub in Black Rocks.**

II. Relationship to RIPRAP: Colorado River Action Plan: Mainstem; V.C. Estimate humpback chub populations; V.C.1. Black Rocks

III. Study Background/Rationale and Hypotheses: Robust population estimates are now critical to monitor recovery of the humpback chub population (USFWS 2001). Recovery goals require estimates of population size at regular intervals to measure population response to management activities under the Recovery Program. A population estimate was made for the 1998–2000 time period (McAda 2002). This scope of work identifies the work necessary to complete a second estimate of population size for humpback chub in Black Rocks.

IV. Study Goals, Objectives, End Product:

A. Goal:

Estimate size and recruitment of the humpback chub population in Black Rocks

B. Objectives:

1. Use mark-recapture to estimate the population size (including adults ^{3}200 mm TL) and recruitment (i.e., juveniles 150–199 mm TL) of humpback chub in Black Rocks.

2. Describe population structure of humpback chub in Black Rocks by analyzing length-frequency distributions.

V. Study area: Upper Colorado River Basin C Black Rocks area (RM 135.5B136.5)

VI. Study Methods/Approach:

Recovery Program (2002) summarized population estimates conducted through 2001 and made recommendations for sampling methodologies for future work. The study methodology outlined here corresponds to those recommendations.

Conduct four intensive 4-day (3 nights) sampling efforts in Black Rocks between mid September and late October in 2003 and 2004, with intervals of 1–2 weeks between samples. Capture as many adult-size chubs as possible using the most efficient gear for handling as many fish as possible for the effort expended. Sampling will encompass the entire length of Black Rocks occupied by humpback chub to ensure that all fish have an equal chance of being captured.

Based on previous field efforts the most effective gear is 1-in inner mesh trammel nets (McAda 2002; Chart and Lentsch 1999). However, there is some concern that trammel nets can produce injuries that might lead to delayed mortality if not used carefully (McAda 2002). To reduce stress to humpback chub, sampling will be done in fall as temperatures are falling in the river (mid September through October). Trammel nets will be run every hour to the extent possible, with 1.5 hr as the absolute maximum length of set. Fewer nets may be set than during the previous study to ensure that maximum length of set is not exceeded.

Extensive sampling will also be done with electrofishing, seining and hoop nets. The extra sampling will especially target chubs < 200 mm TL to estimate population size of fish about to recruit into the adult population. Recapture rates for fish this size are currently unknown, so catch per effort may have to be relied on to estimate recruitment rates. The extra sampling will also be used to evaluate techniques that might supplement or replace (if deemed necessary) trammel netting and reduce potential stress to the fish.

All specimens captured will be identified to species using criteria described by Douglas et al. (1989, 1998). Careful examination and use of specific criteria will be especially important for fish < 200 mm which can be difficult to distinguish to species. After handling, all chubs will be treated in a salt dip (1.5%, ~1 min) before release. In addition, treatment with a commercial fungicide (200 ppm, ~1 hr) will be explored. However, use of the fungicide will require holding the fish in a tank with aeration for about one hour before release.

Measure to total length (+-1 mm) and weigh (+-20 g) all Colorado pikeminnow and humpback chubs captured. PIT tag all Colorado pikeminnow and humpback chubs greater than 160 mm total length. Identify and count all sympatric fishes collected during all sampling efforts.

Non target species are often collected with endangered fish. Because of Recovery Program priorities for control of nonnative fishes in the Colorado River, all smallmouth bass and largemouth bass captured in this study will be sacrificed, preserved and provided to the Colorado Division of Wildlife for the stable isotope study. Other introduced nongame species (e.g. green sunfish or black bullhead) inadvertently collected will be sacrificed and disposed of in a manner that will not constitute a nuisance or as otherwise directed by CDOW.

Capture-recapture data for humpback chub will be placed into a matrix and runt through program CAPTURE. A population estimate will be calculated using the model most suitable for the sampling methods used. Population trends and population size structure will be determined using standard techniques described in Recovery Program (2002). Analysis of similar data collected during 1998 – 2000 indicated that capture probabilities (P^) ranged from 0.04–0.09 and coefficient of variation (CV) ranged from 0.13–0.54 (McAda 2002). These parameters varied with catch rates and number of sampling trips, but the current study will attempt to produce P^s > 0.07 and CV s £ 0.25.

VII. Task Description and Schedule

1. Sample humpback chubs in Black Rocks; fall 2004 (FY 2004 and FY 2005).

2. Compile data annually, prepare preliminary population estimate to be made available before the winter Colorado River researchers meeting and provided to the Recovery Program and USFWS for evaluation. Estimates will include numbers of adults (³200 mm TL) in the population, as well as recruitment by juveniles (150–199 mm TL); winter 2004.

3. Complete summary report describing population size and structure of humpback chub in Black Rocks; Summary report, March 2005.

VIII. FY-2004

Tasks 1 and 2

IX. Budget Summary

FY 2004

Task 1

Labor	FWS	Larval Fish
Lab		
Project Leader (1 week@ 1,880)	$ 1,880	
Administrative Officer (2 weeks @ 1,225)	$ 2,450	
Fishery Biologist (7 weeks @ 1,620)	$ 11,340	
Biological Technicians		
(GS 7 @ 820, 7 weeks)	$ 5,740	
(GS 5/6 @ 600, 7 weeks)	$ 4,200	
Field Equipment		
Vehicle rental, gas, boat gas	$ 2,000	
Equipment maintenance	$ 2,000	
Travel	$ 1,100	
Sub Total	$ 30,710	

Task 2

Labor		
Project Leader (@1880, 1 week)	$ 1,880	
Administrative Officer (@ 1225,1 week)	$ 1,225	
Fishery Biologist (@ 1620,5 weeks)	$ 8,100	
Statistical Consultant (Larval Fish Lab)		$ 1,500
Office Equipment and Materials	$ 1,200	
Travel (meet w/ consultant, BC)	$ 1,500	
Sub Total	$ 13,905	$ 1,500
Total	$ 44,615	$ 1,500
Grand Total	$ 46,115	

FY-2005

Task 1

Labor	
Project Leader (@ 1,974,1 week)	$ 1,974
Administrative Officer (@, 1,287,2 weeks)	$ 2,574

Fishery Biologist (@ 17015 weeks)	$ 8,505	
Biological Technicians		
GS 7 @ 861, 4 weeks	$ 3,444	
GS 5/6 @ 630, 4 weeks	$ 2,520	
Field Equipment		
Vehicle rental, gas, boat gas	$ 1,000	
Equipment maintenance	$ 1,000	
Office Equipment and Materials	$ 650	
Travel	$ 800	
Sub Total	$ 22,467	
Tasks 2 and 3		
Labor		
Project Leader (@ 1974, 4 weeks)	$ 7,896	
Administrative Officer (@ 1287, 2 weeks)	$ 2,574	
Fishery Biologist (@ 1701, 6 weeks)	$ 10,206	
Statistical Consultant		$ 4,000
Office Equipment and Materials	$ 1,000	
Travel (Meet w/consultant, BC)	$ 1,000	
Sub Total	$ 22,676	$ 4,000
Grand Total	$ 49,143	

X. Reviewers: Tom Chart, Richard Valdez

XI. References

Chart, T. E., and L. D. Lentsch. 1999. Flow effects on humpback chub (Gila cypha) in Westwater Canyon. Final Report to Upper Colorado River Endangered Fish Recovery Program, Project Number 39. Utah Wildlife Resources, Moab and Salt Lake City, Utah.

Douglas, M.E., R.R. Miller, and W.L. Minckley. 1998. Multivariate discrimination of Colorado Plateau Gila spp.: The "art of seeing well" revisited. Transactions of the American Fisheries Society 127:163–173.

Douglas, M.E., W.L. Minckley, and H.M. Tyus. 1989. Qualitative characters, identification of Colorado River chubs (Cyprinidae: genus *Gila*) and the "art of seeing well." Copeia 1989:653–662.

McAda, C. W. 2002. Population size and structure of humpback chub in Black Rocks, Colorado River, Colorado. Draft final report to Upper Colorado River Endangered Fish Recovery Program, Project Number 22-a-3. U.S. Fish and Wildlife Service, Grand Junction, Colorado.

Recovery Program (Program Director's Office, Upper Colorado River Endangered Fish Recovery Program). 2002. Protocols for Colorado pikeminnow and humpback chub population estimates. Final Report to Upper Colorado River Endangered Fish Recovery Program. U. S. Fish and Wildlife Service, Denver, Colorado.

USFWS (U. S. Fish and Wildlife Service). 2001. Recovery goals for the endangered fishes of the upper Colorado River Basin. Final Report, U. S. Fish and Wildlife Service, Denver, Colorado.